Uschinsky, belonging in all probability to the proteid bodies, and bearing much resemblance to ferments.

DR. USCHINSKY has made a special study of the tetanus bacillus when grown in this medium, and has examined in some detail the nature of the toxic products thus elaborated. A more satisfactory growth of this organism was procured by adding from one to two per cent. of grape-sugar to the solution, and the anaërobic conditions necessary for its cultivation were obtained by pouring liquid paraffin on the surface. The filtrate of such tetanus cultures was about equal in virulence to that derived from ordinary broth-cultivations of the bacillus. On the other hand, the poisonous properties of the former were far more easily removed than was the case with the broth-cultures, being destroyed by precipitation with alcohol, and also frequently by evaporation *in vacuo* at 33–36° C., this being especially the case when the latter was carried out in the presence of light. By addition of strong alcohol a precipitate was obtained, in which, besides salt, small quantities of albuminous bodies were present, as indicated by Millon's reagent and the xanthoproteic reaction. This precipitate was, however, without any toxic properties.

THE second edition has been issued of a general guide to the Manchester Museum, by Mr. W. G. Hoyle, Keeper of the Museum. The book should be useful in directing attention to the most important specimens, and explaining their character. Its value would be greatly increased, however, by the addition of an index.

"A BIBLIOGRAPHY of Vertebrate Embryology," by Mr. C. S. Minot, has been published by the Boston Society of Natural History. The titles are grouped into subjects, and the subjects are alphabetically arranged, so there is no difficulty in finding the original source of any paper, the title of which is known. An index of authors is also given to facilitate reference. Biological investigators will find the bibliography of great assistance.

THE volume of selections from the philosophical and poetical works of Miss Constance C. W. Naden, compiled by the Misses E. and E. Hughes, and published by Messrs. Bickers and Son, is one of the daintiest that we have seen for some time. The selections from her essay on induction and deduction contain some remarkably fine expressions, and many other parts of the book are of great interest.

MR. P. ANDERSON GRAHAM'S "All the Year with Nature" (Smith, Elder, and Co.) contains a number of reprints of articles originally contributed to various magazines. The author has a chatty style, and his heterogeneous collection will serve to while away an hour or two. The connection of many of the articles with the seasons is not very apparent, and some of the statements are not scientifically accurate, but, taken as a whole, the book is well worth reading.

PART I. of the sixth edition of Prof. Michael Foster's well-known "Text-Book of Physiology" has been published by Messrs. Macmillan and Co. It comprises the first book of the original volume, and deals with the blood, the tissues of movement, and the vascular mechanism. A number of important modifications have been made in the section devoted to the phenomena and mechanism of the heart-beat, but with this exception few changes have been introduced. Since the publication of the first edition, seventeen years ago, Prof. Foster's work has been recognised to be the best of its kind, and the issue of a new edition shows that it retains its position as a physiological "classic."

THE fourth volume of Alembic Club Reprints, published by Mr. W. F. Clay, Edinburgh, is before us. It deals with the foundations of the molecular theory of gases, and comprises papers and extracts of papers by Dalton, Gay-Lussac, and Avogadro. There is no better way of studying the development of an idea than by reading such reprints as those issued under the auspices of the Alembic Club, for they enable the student to see the many difficulties that have to be overcome before a theory crystallises into shape. We therefore welcome this last addition to an excellent series of books.

THE Cambridge University Press has published the first volume of the series of manuals of biological science edited by Mr. Arthur E. Shipley. The book to which we refer is "Elementary Palæontology," by Mr. Henry Woods. In it the author gives a concise account of invertebrate palæontology, chiefly considered from a stratigraphical point of view. The plan of the book is excellent, the zoological features of each group being first described, then the genera of importance geologically are classified, and with this knowledge the student is able to understand the following section dealing with the distribution of the group. Instead of giving archaic illustrations of genera, Mr. Woods includes figures required to explain structure and terminology. The student will benefit by this change. Remarkable pictures of perfectly preserved fossils may suit the popular mind, but the student must study fossils in collections, and he needs more detailed instruction concerning their characteristics. As an introduction to the study of palæontology, Mr. Woods' book is worthy of high praise.

NOTES from the Marine Biological Station, Plymouth.—The past week has been one of the stormiest of the year. Work outside the Sound was quite impossible in our small boats, and even within the harbour was attended with difficulties. The captures included specimens of the Actinian *Cylista viduata*, and of the Dorididæ *Platydoris planata*, *Ægirus punctilucens* and the scarlet *Rostanga coccinea* upon the red incrusting sponge on which it feeds From several hauls of *Antedon rosacea* a small number of the Polychæte commensal *Myzostomum* were obtained. The dogfish in the aquarium (*Scyllium catulus* and *canicula*) have begun to breed.

THE additions to the Zoological Society's Gardens during the past week include a Mozambique Monkey (*Cercopithecus pygerythrus*, ♂) from East Africa, presented by Mr. Bayes; a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mr. C. E. Morres; two —— Jerboas (*Alectaga jaculus*) from Persia, presented by Capt. R. A. Ogilby, F.Z.S.; a Tuatera Lizard (*Sphenodon punctatus*) from New Zealand, presented by Mr. Chas. Smith; a Lion (*Felis leo*, ♀) from West Africa, an American Bison (*Bison americanus*, ♀) from North America, deposited; a Cunning Bassaris (*Bassaris astuta*) from Mexico, purchased.

OUR ASTRONOMICAL COLUMN.

MECHANICAL THEORY OF COMETS. — Prof. J. M. Schaeberle, in the *Astronomical Journal*, No. 306, communicates a "preliminary note on a mechanical theory of comets," this being "a strictly logical consequence of the mechanical theory of the corona." The principles which serve as a basis may be said very briefly to be the following. Any given solar eruption gives rise to both prominences and streams. The ejective force being the same, the mass of a given volume of coronal stream is less than that of a prominence. Assuming mean density of coronal stream to be one-seventh of that of accompanying prominence, the same explosive force which during the last eclipse sent prominences to a height of 80,000 miles, will send coronal matter forming the streams to an infinite distance. Coronal streams extend far, then, into space. The densest portion of the stream is located at the point of minimum velocity, and the coronal streams visible in the last total eclipse were, Prof. Schaeberle says, according to his photographs, apparently most dense in the higher regions,

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proving that the matter was in rapid movement. The mechanical theory of comets supposes coronal streams to issue from the sun at all angles. These streams will penetrate far into space (some crossing one another). The atmosphere of a comet on striking these streams will in projection be in the form of luminous, nearly concentric, arcs, the greatest brilliancy being near the most advanced part of each stratum. More than one coronal stream will produce in the comet multiple tails, the angles between the tails being a function of the velocities of motion, and the inclinations of the streams. An examination of the cases where a tail is turned towards the sun is explained by a coronal stream, having a less velocity than that of the receding comet, thus producing such a phenomenon the moment the stream is entered. Prof. Schaeberle, at the conclusion of the papers, refers to a satisfactory explanation of the "Gegenschein," and also to a plausible explanation of the Aurora, both based on the coronal streams.

THE NEW STAR IN NORMA.—When the announcement of the discovery of this star by Mrs. Fleming reached Prof. F. C. Kapteyn, a search was made by him through his manuscript of his photographic Durchmusterung for this region, with the result (*Astronomische Nachrichten*, No. 3196) that he found the following star, which is "wohl fast ohne Zweifel" identical with Mrs. Fleming's. Its position is

Phot. Mag.	R.A. 1875·0	Decln. 1875·0.
9·2	15h. 21m. 0.5s.	−50° 9′·7

The plates which he had that contained this part of the heavens were taken in 1887, on June 25, July 25, and August 2; and in 1890, on April 29 and May 2. An examination of these showed that on the first three dates the star was not visible, but the last two distinctly indicate it as a star a whole magnitude brighter than the faintest star on the plate. A comparison of its brightness with the following three stars in its neighbourhood was made.

	Mag. in Phot. Diam.	R.A. 1875·0. h. m. s.	Decln. 1875·0. ° ′
(*a*)	9·2	15 20 51·0	−50 21·4
(*b*)	9·1	20 59·0	21·5
(*c*)	9·1	21 35·0	9·4

The results show that Mrs. Fleming's star is brighter than (*a*), scarcely dimmer than (*b*), and a little dimmer than (*c*). Its magnitude then in July and August, 1887, could not have been more than 9·2.

THE NATAL OBSERVATORY.—Mr. Nevill, the Government Astronomer for Natal, has to work under great difficulties. The grant of £800 per annum, made by the Natal Government to the Observatory, is certainly not enough to keep the establishment efficient. When the Observatory was first erected it was a substantially built, rectangular red brick edifice, carrying a light wooden upper structure, which formed equatorial and transit rooms, but there was only one room below, and this had to serve the double purpose of a computing room by day and sleeping room by night. Mr. Nevill has asked the Government to give him more accommodation, but his application has not been granted, the plea being shortness of funds; so he has had extra rooms built entirely at his own expense, and even now the four assistants of the Observatory work in a room which is nothing more than an enclosed verandah. The principal points under investigation at the Observatory are: the parallactic inequality in the motion of the moon, the lunar diameter, the effects of irradiation and its variations upon the moon's apparent semi-diameter, and lunar libration.

MAGNITUDE AND POSITION OF T AURIGÆ.—The current *Comptes Rendus* (November 13) contains a number of observations of Nova Aurigæ, made by M. Bigourdan, at the Paris Observatory. The star's magnitude was compared with that of neighbouring stars on October 10 and 12, and on November 8, 11, and 12. The observations show that from the middle of October to the 8th inst. the light diminished very definitely, and afterwards increased, but on the date of the last observation it had not attained the magnitude observed on October 10. In 1892 M. Bigourdan micrometrically measured the position of the Nova with respect to a neighbouring star, and a repetition of his measurements, after an interval of eighteen months, shows that no change of position has taken place.

PERIOD OF JUPITER'S FIFTH SATELLITE.—Prof. E. E. Barnard's new measures (*Astronomy and Astro-Physics* for November) for the times of elongation of the fifth satellite give a period

P = 11h. 57m. 22·56s.

The value obtained from his last year's value was

P = 11h. 57m. 23·06s.

While Mr. A. Marth, from the same observations, derived a period of

P = 11h. 57m. 21·88s.

The new determination falls, as will be noticed, nearly midway between the two values quoted, and covers a period of 743 revolutions of the satellite.

GEOGRAPHICAL NOTES.

THE fate of the Bjorling exploring expedition, concerning the safety of which much anxiety has been felt in Sweden, has now been ascertained. Messrs. Bjorling and Kalstennius, two young Swedish naturalists, hired a small schooner, the *Ripple*, at St. John's, in June, 1892, and set out for a collecting trip along the west Greenland coast, accompanied by a crew of three men. After leaving the Danish settlements on the west coast last summer, no further news was received from the expedition, and the captains of the whaling vessels at work in Davis Strait this summer were specially requested to look for traces of the *Ripple* and her party. Captain McKay, of the Dundee whaler *Aurora*, who returned last week, reports that he visited the Carey Islands at the entrance to Smith's Sound on June 17 this year, and found there the wreck of the *Ripple*, a number of documents, and the body of one of the ill-fated crew. One of the papers written by Bjorling on August 17, 1892, on which day he had visited the Carey Islands to get provisions from the cache left by Sir George Nares, stated that on leaving the schooner ran aground, and the party had to land. A later note, dated October 12, shows that they attempted to reach Foulke's fjord to winter there, but after reaching Northumberland Island circumstances compelled their return. At the date of writing Bjorling intended to start immediately to endeavour to reach the Eskimo settlements at Cape Faraday or Clarence Head in Ellesmere Land, with the hope of returning to Carey Islands by July 1, 1893, to meet any whaler. In case of not finding a vessel he intended to push on to the Danish settlement. On receiving this news Captain McKay at once headed for Ellesmere Land, but the ice closed in, and he had to turn back. As the provisions would only last until January 1, it is to be feared that the whole party has perished, unless they were successful in reaching the Eskimo. If they did so, and were subsequently able to make their way to the Danish settlements, there may still be hope, but no news can be received until next summer.

THE *Times* announces that the Peruvian Government has awarded a gold medal to Mr. Clements R. Markham, F.R.S., President of the Royal Geographical Society, for the great services he has rendered to Peru in elucidating its geography, and in giving expression "with upright impartiality" to the facts of its history.

MR. W. H. COZENS-HARDY, who has just returned from a summer spent in exploration on the borders of Montenegro and Albania, has succeeded in making a number of observations of high geographical value. He has been able to lay down on a map for the first time the present frontiers of the principality, and from his knowledge of Slavonic languages and the free access accorded to him to the Montenegrin archives, he can also give a most interesting account of the past changes in the boundaries, furnishing, in fact, a chapter in the historical geography of the Balkan peninsula.

THE Arctic skipper Hans Johannessen, of Hammerfest, Norway, has heard from old Yakutsks that from the highest points of the northern shores of the New Siberian Islands a lofty land has been discerned to the north-west, at a distance of about fifteen nautical miles. He thinks, therefore, that should Nansen not steer too close to the coast, this new land might be seen from the masthead. And should the state of the ice be at all favourable, Nansen will, in all probability, attempt to take up his winter quarters there instead of the New Siberian Islands.

FROM a recent number of the *Kölnische Zeitung* we learn the somewhat remarkable fact that Cologne is the largest city in Germany, taking account of the area it covers, Berlin coming only fourth in order. In Cologne, however, only eight per cent.

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